

light beam from each of the plurality of GRIN lenses, the common optical aperture to simultaneously operate on the light beams received from each of the plurality of GRIN lenses and wherein the rhombic prism has an inner surface and the light beams have a P-polarized and a S-polarized component, and wherein the beamsplitter has a coating on the inner surface to separate the S-polarized and P-polarized components of the light beam into spatially separate beams.

23. (Amended) A method, comprising:
- receiving a plurality of at least four input light beams by a single device having a common optical aperture; and
 - spatially separating each of the plurality of at least four input light beams using the common optical aperture.

28. (Amended) An apparatus, comprising:
- means for receiving a plurality of at least four input light beams by a single device having a common optical aperture; and
 - means for spatially separating each of the plurality of at least four input light beams using the common optical aperture.

REMARKS

Applicant respectfully requests reconsideration of this application. The specification has been objected to as not containing an abstract as required by 37 CFR 1.72(b). Applicant wishes to note for the record that an Abstract was filed with the application on July 19, 2001 as evidenced by the enclosed copy of the stamped filing

receipt. Nevertheless, applicant is submitted a copy of the Abstract as requested by the Examiner.

Office Action Summary

Claims 1-10 and 13-31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 4,478,494 of Soref ("Soref").

Status of Claims

Claims 1-31 remain pending in the application. Claims 1, 5, 11, 22, 23 and 28 have been amended to more properly define existing limitations. The amended claims are supported by the specification. No claims have been added. No new matter has been added. No claims have been canceled.

Claim Rejections

Claims 1-10 and 13-31 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Soref. No formal basis of rejection was provided for claims 11 and 12.

With respect to claim 11, the Office Action states:

With regard to claim 11, Soref discloses, as set forth above with respect to claim 10, the invention as claimed--EXCEPT FOR wherein said plurality of ports comprises third and fourth input ports, and wherein the beamsplitter is coupled to receive S-polarized light from the first and third input ports and P-polarized light from the second and fourth input ports, the beamsplitter to combine S-polarized light from the first input port with P-polarized light from the third input port, the beamsplitter to combine S-polarized light from the second input port with P-polarized light from the fourth input port.

Soref, however, does disclose first and second input ports, the S- & P-polarized components of light propagating therethrough/therefrom being combined as depicted in Figs. 3A & 3B. It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Soref such that it further comprise third and fourth input ports, and wherein said beamsplitter was coupled to receive S-polarized light from the first and third input ports and P-polarized light from the second and fourth input ports, the beamsplitter to combine S-polarized light from the first input port with P-polarized light from the third input port, the beamsplitter to combine S-polarized light

from the second input port with P-polarized light from the fourth input port, such combination already being taught for light from existing first and second output and input ports, for at least the purpose of processing additional signals within said apparatus, since it has been held that rearranging parts of an invention involves only routine skill in the art. *In re Japikse*, 86 USPQ 70.

With regard to claim 12, the propagation of light from each of the input ports is substantially parallel to each other (See post-reflected light in Figs. 3A, 3B).

It appears that the Examiner has intended to provide a rejection claim 11 under 35 U.S.C. §103(a) as being unpatentable over Soref in view of purported skill in the art. Applicant submits that amended claim 11 is patentable over the cited reference. Claim 11 has been rewritten in independent format to include the limitations of its base claim 1. Amended claim 11 recites:

An apparatus, comprising:

a housing having a plurality of ports, each of the plurality of ports to receive a corresponding fiber;

a plurality of collimating lenses disposed within the housing, each of the plurality of collimating lenses to receive a light beam from a corresponding port of the plurality of ports; and

a beamsplitter coupled to the plurality of collimating lenses to receive the light beam from each of the plurality of collimating lenses, the beamsplitter having a common optical aperture disposed on an outer surface area to simultaneously receive the light beams received from each of the plurality of collimating lenses, **wherein the plurality of ports comprises first, second, third, and fourth input ports and first and second output ports, and wherein the beamsplitter is coupled to receive S-polarized light from the first and third input ports and P-polarized light from the second and fourth input ports, the beamsplitter to combine S-polarized light from the first input port with P-polarized light from the third input port, the beamsplitter to combine S-polarized light from the second input port with P-polarized light from the fourth input port.**

(emphasis added).

Applicant respectfully submits that it would be impermissible hindsight, based on applicant's own disclosure, to combine Soref with purported skill in the art to arrive at applicant's claimed invention. Applicant respectfully submits that the rote invocation of the skill of one in the art is not sufficient for providing such a modification of Soref and respectfully requests the Examiner to provide a prior art reference of such purported teaching. In addition, applicant respectfully submits that the Office Action's citation to

In re Japikse, 86 USPQ 70, is inapposite. First, *In re Japikse* does not hold a general proposition that that rearranging parts of an invention involves only routine skill in the art, as purported by the Office Action. Rather, the holding of *In re Japikse* with respect to a relocation of parts is specific facts in that case. In particular, *In re Japikse* held “the relocation of Cannon’s switch A-42 so that it may be operated by beaver tail 62 instead of by dog A-2 is devoid of invention.” *In re Japikse*, 86 USPQ 70, 74 (1950).

Moreover, it is not understood how the addition of one or more elements is a rearranging of parts. The Office Action states, respect to claim 11, that

It would have been obvious to one having ordinary skill in the art at the time the invention was made to have modified the apparatus of Soref such that it **further comprise** third and fourth input ports (Office Action, 11/4/02, page 5).

Applicant respectfully requests the Examiner to explain how the addition of limitations is a rearranging of elements if such elements do not exist in the reference cited by the Examiner.

Therefore, applicant respectfully submits that amended claim 11 is patentable over the cited reference.

Given that claim 12 depends from claim 11, applicant submits that claim 12 is also patentable over the cited reference.

Claims 1-10 and 13-21 have been rejected under 35 U.S.C. §103(a) as being unpatentable over Soref. Applicant respectfully submits that amended claim 1 is patentable over the cited reference.

Amended claim 1 recites:

An apparatus, comprising:

a housing having a plurality of at least four ports, each of the plurality of ports coupled to a corresponding one of a plurality of at least four fibers;

a plurality of collimating lenses disposed within the housing, **each of the plurality of collimating lenses to receive a light beam from a corresponding port of the plurality of at least four ports;** and

a beamsplitter coupled to the plurality of collimating lenses to receive the light beam from each of the plurality of collimating lenses, **the beamsplitter**

having a common optical aperture disposed on an outer surface area to simultaneously receive the light beams received from each of the plurality of collimating lenses.

(emphasis added)

Soref teaches a 2 x 2 bypass switch in which light from input fiber 41 may be propagated to either output fiber 65 or output fiber 73, as illustrated in Figures 3A and 3B. As such, there is only a single light beam incident on a particular optical aperture of polarizing beam splitter 43 at any given time. Nothing in Soref teaches or suggests a beamsplitter having a common optical aperture disposed on an outer surface area to simultaneously receive at least four light beams. In addition, applicant respectfully submits that it would be impermissible hindsight, based on applicant's own disclosure, to combine Soref with purported skill in the art to arrive at applicant's claimed invention. Applicant respectfully submits that the rote invocation of the skill of one in the art is not sufficient for providing such a modification of Soref and respectfully requests the Examiner to provide a prior art reference of such purported teaching.

In contrast, amend claim 1 includes the limitations of "each of the plurality of collimating lenses to receive a light beam from a corresponding port of the plurality of at least four ports; and a beamsplitter coupled to the plurality of collimating lenses to receive the light beam from each of the plurality of collimating lenses, the beamsplitter having a common optical aperture disposed on an outer surface area to simultaneously receive the light beams." Therefore, applicant respectfully submits that amended claim 1 is patentable over the cited reference.

Given that claims 2-10 and 13-21 depend from claim 1, applicant submits that claims 2-10 and 13-21 are also patentable over the cited reference.

Claim 22 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Soref. Applicant respectfully submits that amended claim 22 is patentable over the cited reference.

Amended claim 22 recites:

An apparatus, comprising:

a housing having a plurality of ports, each of the plurality of ports to receive a fiber;

a plurality of GRIN lenses disposed within the housing, each of the plurality of GRIN lenses to receive a light beam from a corresponding port of the plurality of ports; and

a rhombic prism having a common optical aperture disposed on an outer surface area, the common optical aperture coupled to the plurality of GRIN lenses to receive the light beam from each of the plurality of GRIN lenses, the common optical aperture to simultaneously operate on the light beams received from each of the plurality of GRIN lenses and wherein **the rhombic prism** has an inner surface and the light beams have a P-polarized and a S-polarized component, and wherein the beamsplitter has a coating on the inner surface to separate the S-polarized and P-polarized components of the light beam into spatially separate beams.

(emphasis added).

Soref teaches a 2 x 2 bypass switch that utilizes a single **cubic** polarizing beam splitter and a 90 degree polarization twist layer of liquid crystal held between two right angle prisms. The cubic polarizing beam splitter 43 is formed by two triangular prisms having their hypotenuse surfaces adjoined. (Soref, Abstract and col. 5, lines 24-31; Figures 3A and 3B).

Nothing in Soref teaches or suggests the use of a rhombic prism. Moreover, one of skill in the art would not be motivated to combine the use of a rhombic prism in the bypass switch of Soref because such a combination would render an inoperable device. If the cubic prism of Soref were somehow replace with a rhombic prism, then a light beam from an input fiber such as fiber 41 would not be propagated to one of the output fibers (e.g., fibers 65 or 73), as required by the switch of Soref. Therefore, one of skill in the art would not be motivated to combine a rhombic prism with the teachings of Soref because such combination would destroy the intent of Soref and render an inoperable device.

Therefore, applicant respectfully submits that claim 22 is patentable over the cited reference.

Claim 23 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Soref. Applicant respectfully submits that amended claim 23 is patentable over the cited reference.

Amended claim 23 recites:

A method, comprising:
receiving a plurality of at least four input light beams by a single device having a common optical aperture; and
spatially separating each of the plurality of at least four input light beams using the common optical aperture.

(emphasis added)

Soref teaches a 2 x 2 bypass switch in which light from input fiber 41 may be propagated to either output fiber 65 or output fiber 73, as illustrated in Figures 3A and 3B. As such, there is only a single light beam incident on a particular optical aperture of polarizing beam splitter 43 at any given time. Nothing in Soref teaches or suggests a method to spatially separate at least four light beams using a common optical aperture.

In contrast, amend claim 23 includes the limitations of “spatially separating each of the plurality of at least four input light beams using the common optical aperture.” Therefore, applicant respectfully submits that amended claim 23 is patentable over the cited reference.

Given that claims 24-27 depend from amended claim 23, applicant submits that claims 24-27 are also patentable over the cited reference.

Claim 28 has been rejected under 35 U.S.C. §103(a) as being unpatentable over Soref. Applicant respectfully submits that amended claim 28 is patentable over the cited reference.

Amended claim 28 recites:

An apparatus, comprising:

means for receiving a plurality of at least four input light beams by a single device having a common optical aperture; and

means for spatially separating each of the plurality of at least four input light beams using the common optical aperture.

(emphasis added)

Soref teaches a 2 x 2 bypass switch in which light from input fiber 41 may be propagated to either output fiber 65 or output fiber 73, as illustrated in Figures 3A and 3B. As such, there is only a single light beam incident on a particular optical aperture of polarizing beam splitter 43 at any given time. Nothing in Soref teaches or suggests an optical device to spatially separate at least four light beams using a common optical aperture.

In contrast, amend claim 28 includes the limitations of “means for spatially separating each of the plurality of at least four input light beams using the common optical aperture.” Therefore, applicant respectfully submits that amended claim 28 is patentable over the cited reference.

Given that claims 29-31 depend from amended claim 28, applicant submits that claims 29-31 are also patentable over the cited reference

In conclusion, applicant respectfully submits that in view of the arguments and amendments set forth herein, the applicable rejections have been overcome.

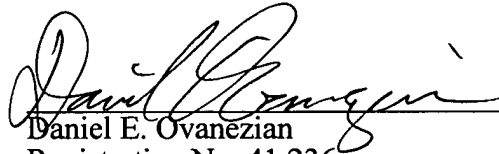
If the Examiner believes a telephone interview would expedite the prosecution of this application, the Examiner is invited to contact Daniel Ovanezian at (408) 720-8300.

If there are any additional charges, please charge our Deposit Account No. 02-2666.

Respectfully submitted,

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

MARKED-UP VERSION OF THE AMENDED CLAIMS

A marked up version of the amended claims is provided below. Additions are indicated with “__” and deletions are indicated within “[].”

1. (Amended) An apparatus, comprising:

a housing having a plurality of at least four ports, each of the plurality of ports coupled to [receive] a corresponding one of a plurality of at least four fibers;

a plurality of collimating lenses disposed within the housing, each of the plurality of collimating lenses to receive a light beam from a corresponding port of the plurality of at least four ports; and

a beamsplitter coupled to the plurality of collimating lenses to receive the light beam from each of the plurality of collimating lenses, the beamsplitter having a common optical aperture disposed on an outer surface area to simultaneously receive the light beams received from each of the plurality of collimating lenses.

5. (Amended) The apparatus of claim 2, wherein the beamsplitter has an inner surface and each of the light beams [has] have a P-polarized and a S-polarized component, and wherein the beamsplitter has a coating on the inner surface to separate the S-polarized and P-polarized components of the light beam into spatially separate beams.

11. (Amended) [The apparatus of claim 10,] An apparatus, comprising:
a housing having a plurality of ports, each of the plurality of ports to receive a
corresponding fiber;
a plurality of collimating lenses disposed within the housing, each of the plurality
of collimating lenses to receive a light beam from a corresponding port of the plurality of
ports; and
a beamsplitter coupled to the plurality of collimating lenses to receive the light
beam from each of the plurality of collimating lenses, the beamsplitter having a common
optical aperture disposed on an outer surface area to simultaneously receive the light
beams received from each of the plurality of collimating lenses, wherein the plurality of
ports comprises first, second, third, and fourth input ports and first and second output
ports, and wherein the beamsplitter is coupled to receive S-polarized light from the first
and third input ports and P-polarized light from the second and fourth input ports, the
beamsplitter to combine S-polarized light from the first input port with P-polarized light
from the third input port, the beamsplitter to combine S-polarized light from the second
input port with P-polarized light from the fourth input port.

b/s's don't
combine -
they split!

22. (Amended) An apparatus, comprising:

a housing having a plurality of ports, each of the plurality of ports to receive a
fiber;

a plurality of GRIN lenses disposed within the housing, each of the plurality of
GRIN lenses to receive a light beam from a corresponding port of the plurality of ports;
and

a rhombic prism having a common optical aperture disposed on an outer surface
area, the common optical aperture coupled to the plurality of GRIN lenses to receive the

light beam from each of the plurality of GRIN lenses, the common optical aperture to simultaneously operate on the light beams received from each of the plurality of GRIN lenses and wherein the rhombic prism has an inner surface and the light beams have a P-polarized and a S-polarized component, and wherein the beamsplitter has a coating on the inner surface to separate the S-polarized and P-polarized components of the light beam into spatially separate beams.

23. (Amended) A method, comprising:

receiving a plurality of at least four input light beams by a single device having a common optical aperture; and

spatially separating each of the plurality of at least four input light beams using the common optical aperture.

28. (Amended) An apparatus, comprising:

means for receiving a plurality of at least four input light beams by a single device having a common optical aperture; and

means for spatially separating each of the plurality of at least four input light beams using the common optical aperture.